

Statement Template for GEO Week 2021

Member Government or Participating Organization
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Committee on Earth Observation Satellites (CEOS)

Full Statement**Group on Earth Observations – GEO Week 2021****Statement of the Committee on Earth Observation Satellites (CEOS)**

Satellite data, measurements, and observations to advance open science and inform decision making.

The Committee on Earth Observation Satellites (CEOS) was established in 1984 at the recommendation of a panel of experts on remote sensing from space and set up under the aegis of the G7 Economic Summit of Industrial Nations Working Group on Growth, Technology, and Employment. This Panel recognised the multidisciplinary nature of space-based Earth observations and the value of coordinating international Earth observation (EO) efforts to benefit society. To this end, the original vision for CEOS was to coordinate and harmonise Earth observations to make it easier for the user community to access and use satellite data. Thirty-seven years later, data user communities worldwide, and the value to them of sustained space-based Earth observation data and measurements for societal benefit, continue to be priorities for CEOS. We remain firm in our commitment to deliver space-based Earth observation data and solutions in an open, sustained and accessible way for all global citizens.

International cooperation in space-based Earth observation data is more urgent today than it has ever been, particularly in light of the recent Intergovernmental Panel on Climate Change (IPCC)'s Sixth Assessment (August 2021) report and the stark warnings it contains of the effects of human-induced climate change. Through the sustained investments of its member Agencies, CEOS continues to effectively provide an important international coordination mechanism. To this end, we also practice self-examination to ensure resilience in a politically dynamic world and changing planet. CEOS currently consists of sixty-one Member and Associate Agencies, all of whom dedicate time, expertise, and resources on a "best efforts" basis to fulfil the role CEOS has as the space-based component of the Group on Earth Observations (GEO) and, more specifically, the Global Earth Observation System of Systems (GEOSS).

GEO is a principal stakeholder for CEOS Members and Associates, many of whom are active and/or exercise leadership roles across the 2020-2022 GEO Work Programme and in its Engagement Priorities. To be clear, experts from the five standing CEOS working groups (on Capacity Building and Data Democracy; Climate; Calibration and Validation; Disasters; and Information Systems and Services), the seven CEOS Virtual Constellations (on Atmospheric Composition; Land Surface Imaging; Ocean Colour Radiometry; Ocean Surface Topography; Ocean Surface Vector Wind; Precipitation; and Sea Surface Temperature), two *ad hoc* teams (on Sustainable Development Goals; and Coastal Observations Applications Services and Tools), and other activities (the Group on

Remote Sensing for Biodiversity; CEOS Ocean Variables Enabling Research and Applications for GEO; and the Earth Observation Training, Education, and Capacity Development Network) engage on an ongoing basis in GEO Work Programme activities. CEOS supports the GEO Programme Board and serves as a Participating Organisation observer to the GEO Executive Committee. CEOS, as the “space arm” of GEO, is making accessible to GEO Members, Participating Organisations, and external users, calibrated and validated satellite data and measurements in support of adaptation, mitigation, resilience, and other elements of the 2030 Agenda for Sustainable Development; the Sendai Framework for Disaster Risk Reduction 2015-2030; and the Paris Agreement.

Under the 2021 CEOS Chair, the United States National Aeronautics and Space Administration (NASA), CEOS has focussed on the theme, “Space-based Earth Observation Data for Open Science and Decision Support”. The aim of this spotlight is to more vigorously advance the concept of open science and open data as accelerators for the societal benefits that GEO, CEOS and other forums seek to realise. CEOS advocates that Earth observation data, and the tools and decision mechanisms that support it, should be accessible, transparent and reproducible. This principle is in direct alignment with the “draft GEO Statement on Open Science”, submitted by the GEO Capacity Development Working Group to the GEO Programme Board for its consideration earlier this year, as well as with the emerging, broader draft “GEO Statement on Open Knowledge”, which takes the open science advocacy one step further in providing evidence-based information for decision-making. CEOS is pleased to be aligned with GEO for this important and practical purpose. Indeed, work has already begun in earnest in this area, as CEOS is a convening partner in the recently formed Open Earth Alliance (OEA), which is intended to expand the impact of technology solutions, including but not limited to the Open Data Cube (ODC). CEOS encourages GEO data user communities to engage with this potentially very powerful forum through its activities, which include cloud-based solutions to handle big data that is reproducible and comes with fully traceable quality assurance. This aspect is becoming increasingly central to EO usability.

With too many advancements to convey in this short statement, CEOS would like to highlight a few key areas of interest to GEO.

In 2020, CEOS began to coordinate efforts in support of the first Global Stocktake (GST) of the 2015 Paris Agreement among Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Under the agreement, individual countries will be required to submit their anthropogenic emission reduction goals as part of their Nationally Determined Contributions (NDCs) every five years. The outcome of the GST will inform the preparation of subsequent NDCs in order to allow for increased ambition and climate action to achieve the purpose of the Paris Agreement and its long-term goals. CEOS has adopted a phased approach to defining and actioning space-based contributions to the GST in the next two years, looking at mitigation, adaptation and financial mechanisms. CEOS engagement with GEO entities, in particular on adaptation, aspects of “loss and damage” and equity of access to data and services are key. In addition, CEOS strongly supports those areas of data provision critical for improved mitigation of climate change, notably in support

of Agriculture, Forestry and Other Land Use (AFOLU) and Greenhouse Gas (GHG) flux communities and their support to national GHG inventories.

For five years, Analysis Ready Data (ARD) has been a major focus of CEOS, in recognition of the increasing demands from users for quick and efficient answers to real-world problems. CEOS has an agreed ARD strategy that is evolving in light of past experience. There are currently two CEOS Analysis Ready Data for Land (CARD4L) compliant datasets available (Landsat Collection 2 Surface Reflectance and Surface Temperature), with an additional seven under development. The successful CEOS ARD framework that was developed at the outset is currently being considered for expansion beyond its initial land focus into the marine environment. With increasing interest from the private sector, the availability of CARD4L datasets from both institutional and private providers is expected to rise significantly in the future and participation of the broader GEO community will be vital going forward. CEOS encourages GEO's continued engagement on ARD through the numerous initiatives that span the GEO programme of work.

Informal discussions on Sustainable Development Goals (SDGs) started in CEOS in 2015, with a dedicated *ad hoc* team (AHT) being established in 2016. After discussions with GEO on user needs, the SDG-AHT has focused on four SDG indicators that are of particular relevance to space-based EO, namely: 6.6.1 water-related ecosystems (in partnership with GEO Wetlands, GEO AquaWatch, GEO GLOWS); 11.3.1 urban land consumption (in partnership with GEO HPI, GEO GUOI); 14.1.1 coastal eutrophication (in partnership with GEO Blue Planet, GEO AquaWatch); and 15.3.1 land degradation (in partnership with the GEO Land Degradation Neutrality (LDN) initiative). *Ad hoc* teams are, by their very nature, temporary mechanisms. Since its establishment, CEOS has extended the duration of the SDG-AHT, and it is now going through a transition discussion phase to define a more sustainable future for SDG work within CEOS.

In 2020, a new *ad hoc* team was established as the COAST-AHT (Coastal Observations Applications Services and Tools *Ad Hoc* Team), which aims to focus on the positive role that space-based Earth observations already play in the highly sensitive environments that span global coastlines. This heightened focus by CEOS on marine science comes at a time when the Intergovernmental Oceanographic Commission of UNESCO (IOC) launch their "UN Decade of Ocean Science for Sustainable Development" (also known as *The Decade*). COAST has been endorsed as an official contribution to *The Decade*, and CEOS continues to actively seek to identify other areas where collaborations can be established through our existing marine science groups, namely: the four Virtual Constellations that focus on the marine environment (Ocean Colour Radiometry, Ocean Surface Topography, Ocean Surface Vector Wind and Sea Surface Temperature) and the CEOS Ocean Variables Enabling Research and Applications for GEO (COVERAGE) initiative. COVERAGE is a cross-cutting research and development initiative to provide improved access to multivariate oceanic data to help data user communities fully realise the potential of satellite remote sensing data for their marine science questions. Primary partnering GEO initiatives include the Marine Biodiversity Observation Network (MBON) and Blue Planet.

Disaster Risk Management (DRM) is a high priority for CEOS. The CEOS Working Group on Disasters (WGDisasters) maintains a robust relationship with the various disaster-focussed activities GEO supports, particularly with GEO-DARMA. The WGDisasters has undertaken a series of pilot studies as a testbed for potential future implementation as DRM offerings from the satellite community. These pilots include those related to floods, landslides, seismic hazards, volcanoes, and wildfires. The CEOS Working Group on Disasters is a key contributor to the GEO Geohazard Supersites and Natural Laboratories initiative (GSNL), which is a voluntary international partnership aiming to improve, through an open science approach, geophysical scientific research and geohazard assessment, promoting rapid and effective uptake of new scientific results for enhanced societal benefits in disaster risk reduction.

Many of these actions in sustainability and disaster risk reduction also support the climate objectives set out in the Paris Agreement. The interactions between the three major UN statements of Policy (the Paris Agreement, the Sendai Framework for Disaster Risk Reduction 2015-2030, and the 2030 Agenda for Sustainable Development), together with IOC's UN Decade of Ocean Science for Sustainable Development, are very strong and allow multiple benefits to be derived from CEOS data inputs. It is important that these complementarities are fully exploited by the CEOS and GEO communities.

CEOS is pleased to have a close and mutual partnership with GEO. With the advent of a new GEO Work Programme post 2022, and the results of the mid-term review in the meantime, CEOS looks forward to discussing with GEO common goals, priorities, and objectives as CEOS resources allow. CEOS stands ready to support GEO as it reflects on the mid-term evaluation and as it starts to prepare for the strategic planning process for the next Strategic Plan. Our leadership succession in November 2021 will transition the CEOS Chair from the United States National Aeronautics and Space Administration (NASA) to the Centre National d'Études Spatiales (CNES) of France as the 2022 CEOS Chair. In transition also will be the CEOS Strategic Implementation Team (SIT) Chair as it moves from the 2019-2021 joint CEOS SIT Co-Chairs, Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Geoscience Australia (GA), to the European Space Agency (ESA) as the 2021-2023 CEOS SIT Chair.